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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/706,345

**Applicant(s)**

CHIMITT ET AL.

**Examiner**

ILWOO PARK

**Art Unit**

2182

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7, 9, 11, 12, 14-16 and 18-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5, 7, 9, 11, 12, 14-16 and 18-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ ~~Notice of Informal Patent Application~~
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Claims 1-5, 7, 9, 11, 12, 14-16, and 18-25 are presented for examination.

Venkatesh et al was cited in the previous action.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-5, 7, 9, 11, 12, 14-16, and 18-25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The Specification does not include "before the IRP reaches a file system associated with the IRP." The Specification even does not disclose a "file system."

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –  
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 4, 5, 7, 9, 11, 12, 14, 16, and 18-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Venkatesh et al. [US 2003/0158836 A1].

As for claim 1, Venkatesh et al teach a method for processing input/output request packets (IRPs) directed to a Data Volume for providing a single logical storage device to users and applications of a computing system ["meta file system that appears to a user or application program to be a single file system" in paragraph 0083; "meta file system manager...permitting users and application programs...as if the meta file system were one large conventional file system" in paragraph 0035], the Data Volume having a meta-data extent and at least one data extent [e.g., metadata 158, data 157 in fig. 10; or file system metadata, directories, and files in fig. 1], wherein the meta-data extent and at least one data extent are Basic Volumes, and the method is implemented ["file system layer for mapping file names" in paragraph 0006; "meta file system" in figs. 1-2; paragraph 0035; VFS 143 in fig. 9] above a Basic Volume Manager ["a number of software layers including a file system layer for mapping file names to logical storage locations, and a storage layer for cache management" in paragraph 0006; UxFS 144, MPFS 152 in fig. 9], the method comprising the steps of:

intercepting an initial IRP [e.g., "client makes a request for access to a file stored in a cached disk array 110 over the data network 111" in paragraph 0061] before the IRP reaches a file system ["data movers 115, 116, 117 as a front end to the cached disk array 114" in paragraph 0054 and "file systems A:, B:, C:, D:" in fig. 8] associated with the IRP;

evaluating [e.g., “translations of NFS requests to the intended physical file storage devices” in paragraph 0057; or “requests are interpreted by the NFS routines 141 and forwarded to the meta file system manager 146” in paragraph 0061] the initial IRP by a first volume filter [e.g., “software structure that is replicated in each data mover 115” in paragraph 0057] associated with the meta-data extent to determine the meta-data extent to handle the IRP [e.g., ‘meta file system manager 146 includes a routine for accessing the root directory and checking the meta file system flag and a routine for accessing a directory and checking an attribute’ in paragraphs 0059, 0060, “meta file system routines to recognize and interpret external links to objects in other file system cells” in paragraph 0059];

directing [“forwarding the request through the Virtual File System (VFS) to the meta file system manager 146” in paragraph 0062] the IRP by the first volume filter to the appropriate meta-data extent; and

redirecting [“forwarding the request to the data mover that owns the file system” in paragraph 0066] the IRP from the meta-data extent to a second volume filter [“other data mover having software structure that owns the file system” in paragraphs 0063, 0066] associated with the at least one data extent; and

returning a response [e.g., “obtaining metadata” in paragraph 0078] to the initial IRP from the second volume filter associated with the at least one data extent;

wherein the meta-data extent is a first logical drive and the at least one data extent is a second logical drive [e.g., metadata 158, data 157 in fig. 10; “the file system

cell named A: is essentially a repository for metadata of the user-visible file system",  
"file system cells (B:, C:, and D:) containing user or application files" in paragraph 0055];

the Data Volume appears as a single logical storage device to the users and the applications ["meta file system that appears to a user or application program to be a single file system" in paragraph 0083; "meta file system manager...permitting users and application programs...as if the meta file system were one large conventional file system" in paragraph 0035]; and

the meta-data extent comprises configuration information [e.g., "volume label, ownership, access permission, time stamps, updates, consistency flag, etc." in paragraph 0033] for use in setting up and maintaining the Data Volume.

6. As for claim 2, Venkatesh et al teach the IRP is initiated by an originator ['client' in paragraph 0061] of input/output (I/O).
7. As for claim 4, Venkatesh et al teach the meta-data extent is associated with a plurality of data extents [paragraph 0033].
8. As for claims 5, 11, and 24, Venkatesh et al teach the plurality of data extents are located on a plurality of physical disks [e.g., data storage 120-122 in fig. 8].
9. As for claim 7, Venkatesh et al teach creating additional IRPs by the volume filter, each additional IRP being derived from the initiated IRP and related to a single data extent [e.g., file lock request in order to obtain a lock, new metadata, and metadata version number in paragraph 0065, notification of a release of the lock in paragraph 0067].

10. As for claim 9, Venkatesh et al teach a method for storing data across at least one physical disk and presenting the data as a single virtual disk ["meta file system that appears to a user or application program to be a single file system" in paragraph 0083; "meta file system manager...permitting users and application programs...as if the meta file system were one large conventional file system" in paragraph 0035], comprising the steps of:

intercepting [e.g., "client makes a request for access to a file stored in a cached disk array 110 over the data network 111" in paragraph 0061] a first input/output request packet (IRP) from an originator before the IRP reaches a file system ["data movers 115, 116, 117 as a front end to the cached disk array 114" in paragraph 0054 and "file systems A:, B:, C:, D:" in fig. 8] associated with the IRP;

forwarding ["forwarding the request through the Virtual File System to the meta file system manager 146" in paragraph 0062] the first IRP to a first volume filter [e.g., meta file system manager 146; "software structure that is replicated in each data mover 115" in paragraph 0057; fig. 9] associated with the meta-data extent;

creating an additional IRP [e.g., file lock request in order to obtain a lock, new metadata, and metadata version number in paragraph 0065, notification of a release of the lock in paragraph 0067] by the first volume filter for each data extent affected by the first IRP;

transmitting ["forwarding the request to the data mover that owns the file subsystem cell" in paragraph 0066] each additional IRP to a second volume filter ["other

data mover having software structure that owns the file system" in paragraphs 0063, 0066] associated with each data extent affected by the first IRP;

allowing each additional IRP to pass through the second volume filter associated with volume filter of each data extent affected by the first IRP; and

returning a response ["obtaining metadata" in paragraph 0078] to the first IRP from each second volume filter associated with the at least one data extent to the originator of I/O.

11. As for claim 12, Venkatesh et al teach the data extents affected by the first IRP are located on separate physical disks [offline storage medium and online storage medium in paragraph 0077].

12. As for claim 14, Venkatesh et al teach a computer system for providing a single Data Volumes of data storage to users and applications of the computing system, the system comprising:

a plurality of storage clients connected to at least one storage server across a computer network [fig. 8];

a plurality of magnetic disks wherein Data Volumes may be created [fig. 3] and virtually presented to said storage clients, each of Data Volumes having a meta-data extent and at least one data extent [fig. 2], the meta-data extent including a first volume filter [e.g., "software structure that is replicated in each data mover 115" in paragraph 0057; fig. 9] adapted to intercept and redirect ["forwarding the request to the data mover that owns the file subsystem cell" in paragraph 0066] input/output request packets (IRPs) received from one of the storage clients, before the IRP is received by an



associated file system ["data movers 115, 116, 117 as a front end to the cached disk array 114" in paragraph 0054 and "file systems A:, B:, C:, D:" in fig. 8], to a second volume filter ["other data mover having software structure that owns the file system" in paragraphs 0063, 0066] associated with the at least one data extent, said first volume filter configured to create an additional IRP [e.g., file lock request in order to obtain a lock, new metadata, and metadata version number in paragraph 0065, notification of a release of the lock in paragraph 0067] for each data extent affected by the IRP; the second volume filter associated with each of the at least one data extent returns a response ["obtaining metadata" in paragraph 0078] to the IRP, and wherein the first and second volume filters are implemented above a Basic Volume Manager [e.g., "storage layer for cache management" in paragraph 0006; UxFS 144, MPFS 152 in fig. 9]; and a central management facility [e.g., control station 123 in fig. 8] for controlling the at least one storage server;

wherein the meta-data extent is a first logical drive and the at least one data extent is a second logical drive [e.g., metadata 158, data 157 in fig. 10];

the Data Volume appears as a single logical storage device to the users and the applications ["meta file system that appears to a user or application program to be a single file system" in paragraph 0083; "meta file system manager...permitting users and application programs...as if the meta file system were one large conventional file system" in paragraph 0035]; and

the meta-data extent comprises configuration information [e.g., "volume label, ownership, access permission, time stamps, updates, consistency flag, etc." in paragraph 0033] for use in setting up and maintaining the Data Volume.

13. As for claim 16, Venkatesh et al teach each storage client is presented with a virtual disk including at least one Date Volume having a meta-data extent and at least one data extent [paragraph 0035; fig. 1].

14. As for claim 18, Venkatesh et al teach the at least one data extent is a plurality of data extents and the IRPs are redirected to the data extents based on which data extents are affected by the IRPs [e.g., pointer of the object for accessing the object in paragraphs 0072, 0073, sending a file lock request using file system ID in figs. 10 and 13].

15. As for claim 19, Venkatesh et al teach each storage client is presented with a particular Date Volume having a meta-data extent and at least one data extent [paragraph 0035; fig. 1].

16. As for claim 20, Venkatesh et al teach the Date Volume is a simple volume [fig. 1].

17. As for claim 21, Venkatesh et al teach the Date Volume is a spanned volume [fig. 1].

18. As for claims 22 and 25, Venkatesh et al teach the Date Volume includes at least three Basic Volumes and a volume filter is logically disposed above said Basic volumes [figs. 2 and 9].

19. As for claim 23, Venkatesh et al teach a volume filter for redirecting input/output request packets (IRPs) sent from an input/output (I/O) originator, the volume filter comprising:

intercepting means for intercepting [e.g., "client makes a request for access to a file stored in a cached disk array 110 over the data network 111" in paragraph 0061; "VFS translated NFS Common File System requests" in paragraph 0057] IRPs sent to a meta-data extent associated with a Basic Volume before the IRP is received by an associated file system ["data movers 115, 116, 117 as a front end to the cached disk array 114" in paragraph 0054 and "file systems A:, B:, C:, D:" in fig. 8];

evaluating means [e.g., "translations of NFS requests to the intended physical file storage devices" in paragraph 0057; or "requests are interpreted by the NFS routines 141 and forwarded to the meta file system manager 146" in paragraph 0061] for evaluating IRPs to determine a meta-data extent to handle the IRP [e.g., 'meta file system manager 146 includes a routine for accessing the root directory and checking the meta file system flag and a routine for accessing a directory and checking an attribute' in paragraphs 0059, 0060, "meta file system routines to recognize and interpret external links to objects in other file system cells" in paragraph 0059]; and

redirecting means ["VFS forwarding the request from the meta file system manager 146 in one data mover to MPFS 152 for the other data mover that owns the file subsystem cell" in paragraph 0066 and figs. 9-10] for redirecting the IRPs to at least one data extent associated with at least one other Basic Volume wherein a plurality of

data extents are associated [fig. 8; paragraph 0010] with an equal number of Basic Volumes; and

creating means for creating an additional IRP [e.g., file lock request in order to obtain a lock, new metadata, and metadata version number in paragraph 0065, notification of a release of the lock in paragraph 0067] for each data extent affected by a redirected IRP

wherein the meta-data extent is a first logical drive and the at least one data extent is a second logical drive [e.g., metadata 158, data 157 in fig. 10];

the Data Volume appears as a single logical storage device to the users and the applications ["meta file system that appears to a user or application program to be a single file system" in paragraph 0083; "meta file system manager...permitting users and application programs...as if the meta file system were one large conventional file system" in paragraph 0035]; and

the meta-data extent comprises configuration information [e.g., "volume label, ownership, access permission, time stamps, updates, consistency flag, etc." in paragraph 0033] for use in setting up and maintaining the Data Volume.

### ***Claim Rejections - 35 USC § 103***

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Venkatesh et al. [US 2003/0158836 A1] in view of well known in the art.

As for claim 3, Venkatesh et al do not disclose the originator of I/O is a Small Computer Interface Target Mode Driver (SCSITMD); however, a Small Computer Interface Target Mode Driver (SCSITMD) for issuing an I/O request for file access is well known in the art. At the time the invention, one of ordinary skill in the art would have been motivated to include the Small Computer Interface Target Mode Driver (SCSITMD) for issuing an I/O request in order to increase applicability for adapting prevalent SCSI connection for accessing files.

As for claim 15, Venkatesh et al do not disclose the computer network is a fibre channel network; however, computer network including a fibre channel network for accessing files in a storage is well known in the art. At the time the invention, one of ordinary skill in the art would have been motivated to include a fibre channel network in order to increase applicability for adapting prevalent fibre channel network for accessing files.

### ***Response to Arguments***

22. Applicant's arguments filed 3/2/2009 have been fully considered but they are not persuasive. In the Remarks, Applicant argues in substance that applicant disagrees with the examiner's interpretation of the "volume filter" of claim 1 as a "data mover" in Venkatesh because the volume filter needs to be implemented outside of the .native operating system. The examiner respectfully disagrees. As shown above revised

rejection, Venkatesh discloses a file system stored in the cached disk array 114 in fig. 8 below the data mover as the volume filter.

### ***Conclusion***

23. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ilwoo Park whose telephone number is (571) 272-4155. The examiner can normally be reached on Monday through Friday from 9:00 AM to 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For more information about the PAIR system see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Ilwoo Park/  
Primary Examiner, Art Unit 2182  
May 21, 2009